PERFORMANCE, ACCEPTANCE and DELIVERY

REQUIREMENTS

FOR THE

28-VOLT EMERGENCY POWER SYSTEM

(11/14/2003)

1.0 **SCOPE**

This document identifies the performance, acceptance and delivery requirements for the 28-volt Emergency Power System. The 28-volt emergency power system shall meet the minimum requirements for Commercial Off-the-Shelf (COTS) equipment as defined herein.

2.0 **APPLICABLE DOCUMENTS**

2.1 **Government Documents.** The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

SPECIFICATIONS:

MILITARY

ARINC-404	Air Transport Equipment Cases and Racking
MIL-C-5541	Chemical Conversion Coating on Aluminum and Aluminum Alloys
MIL-I-45208	Inspection System Requirements
MIL-W-16878	General Specification for Insulated Electrical Wire
MIL-E-917	Basic Requirements Electric Power Equipment
MIL-W-22759	Electric Wire, Tin Coated Copper, 600 Volt, 150_C

STANDARDS:

FEDERAL (None)

MILITARY

MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-167 –1	Mechanical Vibrations of Shipboard Equipment
MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for Control of Electromagnetic Interference
MIL-STD-740-1	Airborne Sound Measurements and Acceptance Criteria of Shipboard Equipment
MIL-STD-740-2	Structure borne Vibratory Acceleration Measurements and Acceptance Criteria of Shipboard Equipment
MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment, and Facilities MIL-STD-45662 Calibration

PUBLICATIONS: (None)

HANDBOOKS:

MIL-HDBK-157	Transportation Criteria
MIL-HDBK-217	Reliability Prediction of Electronic Equipment Reliability
H4/H8	Commercial and Government Entity (CAGE)Publication

MANUALS

NAVSEA	Parts Application and Reliability Information
TE-OOO-AB-GTP-O10	Manual for Navy Electronic Equipment.

OTHER

ANSI-IPC-A61 0	Acceptability of Printed Board Assemblies
NAVSEA 9310	Lithium Battery Safety Testing

2.2 **Non-Government Documents.** The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issue in effect on date of invitation for bids or request for proposal shall apply.

ELECTRICAL INDUSTRIES ASSOCIATION (EIA)

EIA RS-310-C	Racks, Panels and Associated Equipment

2.3 Order of Precedence. In the event of conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall take precedence.

3. 0 **REQUIREMENTS**

3.1 **Item Definition.** The unit described herein consists of 28-volt emergency power system used for powering critical systems in the event of a failure of the main electrical system.

3.1.1 **Block Diagram.** Figure 1 shows a functional block diagram for the 28 volt emergency power system.

3.1.2 **Functional Description**. The 28 volt emergency power system shall contain a battery charger circuit to maintain the battery pack at full charge from a 28 volt DC input and indicate charge status of the battery. The power source shall provide a minimum of 20 amp-hour capacity with an output terminal voltage of 24 volts or greater when discharged at a continuous current of 10 amps. The power source shall also be capable of providing, at a minimum, a three-step discharge consisting of 7 amps for 60 minutes, 14 amps for 20 minutes, and 20 amps for 10 minutes, with power source output voltage above 24 volts DC for the duration of each step.. The three discharge steps shall be run sequentially with no rest periods between steps. The power source shall be diode coupled to the output connector to prevent back charging of the battery from the emergency bus.

3.1.3 **Interface Description**

3.1.3.1 **Physical.** The 28-volt emergency power system shall be rack mounted using an ARINC-404 ATR mounting system, part number 404-75-S-1/DPXB-0 with integral connector and rear guide pins. Figure 2 provides connector part numbers and pin definitions for mating connectors. Figure 3 shows the emergency power system as an assembly. The mating mounting bracket and connector will be provided by the vendor.

3.2 **Characteristics**

3.2.1 **Performance Characteristics**

3.2.1.1 **Input Voltage.** The 28-volt emergency power system input voltage for battery charging shall be 24 to 32 volts DC, with a maximum 200 millivolt peak to peak ripple.

3.2.1.2 **Input Current.** The 28-volt emergency power system input current shall be 5 amps maximum for battery charging operations. A circuit breaker external to the unit will be provided by the procuring activity.

3.2.1.3 **Output Voltage.** The 28-volt emergency power system output voltage shall be 24 volts DC minimum to 32 volts DC maximum, nominally 28 volts DC.

3.2.1.4 **Duty/Output**. The 28 volt emergency power system in a fully charged state shall be rated for 7 amps for 60 minutes, 14 amps for 20 minutes and 20 amps for 10 minutes. Power source output terminal voltage shall be 24V minimum during each discharge step with the steps run sequentially without rest periods or recharging between steps. Operating time is battery capacity limited.

3.2.1.5 **Battery Voltage Test.** There will be a pair of voltage test points which will allow the voltage of the emergency battery to be checked with an external volt meter. The test points will be current limited through a pair of 1000 ohm resistors to prevent accidental short circuiting of these points. The test points will be two pins on the rear panel connector.

NOTE

If it is advantageous to the cell chemistry to monitor individual cell voltages and/or cell temperature, a second connector may be added to the battery container wired for monitoring these functions. The use of this connector would be reserved for the battery test station only. Mounting of this connector shall not interfere with the present battery to boat connection.

3.2.1.6 **Full Charge Indicator**. The 28-volt emergency power system shall provide a relay contact closure to indicate the battery is fully charged. The contact closure shall be normally open and shall close to indicate full charge. The contacts will be rated for 28 volts DC, 100 milliamps minimum.

3.2.1.7 **Controls.** There are no user accessible controls.

3.2.1.8 **Output On Control.** The 28-volt emergency power system shall have a control input on the output connector which will allow an external switch closure to connect or disconnect the emergency power system output *to* conserve battery power when the system is not in use. The external switch will be rated *for* 28 volts DC, 100 milliamps minimum. The external switch will be provided by the procuring activity.

3.2.2 **Physical Characteristics**

3.2.2.1 **Physical Dimensions.** Figures 4 and 5 show the physical dimensions for the 28-volt emergency power system.

3.2.2.2 **Weight.** The 28 volt emergency power system power supply (5793519-2) shall not exceed 50 lbs. maximum. The mounting tray (5793519-3) shall not exceed 2 lbs. maximum.

3.2.3 **Grounding**

3.2.3.1 **Chassis Grounding.** The 28-volt emergency power system chassis shall provide grounding provisions as shown in Figure 4. The design and construction shall be such that all exposed metal parts are at ground potential. Both the input and output circuits shall be ungrounded. A 10-32 grounding stud extending 1/2 inch nominal from the front panel with associated wing nut and locking hardware shall be provided as a safety ground connection.

3.2.3.2 **Ground Fault Detection Voltage.** The 28-volt emergency power system shall be able to withstand a nominal 28 VDC ground fault detection voltage shall be impressed on the input and output circuits continuously. The maximum current capacity of this ground fault detection system shall be limited to 1 milliamp.

3.2.4 **Insulation Resistance**. The insulation resistance for both the input and output circuits shall be 50 megohms minimum.

3.2.4.1 **Dielectric Withstanding Voltage.** The 28 volt emergency power system shall be capable of withstanding a 500 VDC dielectric test voltage. The equipment shall prevent electrical breakdown such as corona, flash over, spark over or insulation breakdown when subjected to the dielectric test periods up to one minute. The test voltage will be applied between any single input or output pin (except the 28 volt input and the 28 volt input return) and chassis ground. The 28 volt input and the 28 volt input return shall be shorted together prior to the application *of test voltage to either pin for this test.*

3.2.4.2 **Connectors.** Connectors shall be located as shown in Figure 5. The connectors shall be an Hypertronics "L" series connectors which will allow blind mating. Connector pin assignments shall be as shown in Figure 2.

3.2.5 **Reliability**

3.2.5.1 **MTBF.** The Mean- Time-Between-Failures (MTBF) *of* the 28 volt emergency power system defined by this specification shall be at least 30,000 hours. An N_{SB} environment as specified in MIL-HDBK-217 and an operating temperature of 40° C shall be used to calculate the equipment MTBF. Failure rate sources other than MIL-HDBK-217 shall be identified for each application with rationale for its use.

3.2.5.2 **Reliability Tests.** Each unit shall be cycled (burned in) at the rated duty cycle/output current and charge cycle in a 40° C environment.

3.2.5.3 **Equipment Life**. The 28 volt emergency power system life with normal preventative maintenance shall be 15 years minimum with an operating life expectancy *of* 50,000 hours minimum.

3.2.6 **Maintainability.** The 28 volt emergency power system specified herein shall not require scheduled preventive maintenance more frequently than every 180 days, with an annual capacity/testing periodicity. Preventive maintenance shall be defined as any mechanical inspections/adjustments or any special charge/discharge conditioning cycles, recommended by the power source manufacturer, to ensure the power source meets minimum requirements. Proper operation of the Switches on the Output On Control circuits and the full Charge Indicator circuit will be verified during this maintenance period (this will be accomplished through a battery test station). A modular design concept shall be used to the extent practicable. Repair shall be limited to the replacement of assemblies, preferably of a plug-in type and shall not require the use of a soldering iron. Mean-Time-To-Repair (MTTR) of the equipment shall not exceed 4 hours. MIL-STD-1472 maintainability design criteria shall be used as a guide for achieving the MTTR requirements.

3.2.7 **Environmental Conditions.** The 28 volt Emergency Power System shall meet the functional, performance, reliability and service life requirements specified herein when subjected to the environmental conditions specified in the following paragraphs, both operating and non-operating. For environmental condition specifications, operating is defined as being used or operated in an active or powered state. Non-operating is defined as being in a dormant or non-powered state.

3.2.7.1 **Non-Operating Conditions**

3.2.7.1.1 **Non-Operating Temperature.** The 28 volt emergency power system shall not be damaged nor shall subsequent operational performance be degraded as a result of being subjected to temperature over the range of –17.8° C to + 60° C (O° F to 140° F).

3.2.7.1.2 **Temperature Shock.** The 28 volt emergency power system shall not be damaged nor shall subsequent operational performance be degraded as a result of being subjected to a temperature change, upward or downward, over a range from +21.1° C to -17.8° C (70° F to O° F) at a maximum rate of 4° C/min.

3.2.7.1.3 **Non-Operating Pressure**

3.2.7.1.3.1 **Air Transport and Ground Storage/Transport**. The 28 volt emergency power system shall not be damaged nor shall subsequent operational performance be degraded as a result of being subjected to an atmospheric pressure range of 57 kPa to 101 kPa (8.26 psi to 14.64 psi).

3.2.7.1.4 **Shock.** The 28 volt emergency power system shall be designed to withstand the shock loading anticipated during transport (when properly configured or packaged *for* transport) of 20 g peak acceleration, 11 milliseconds duration per MIl-HDBK-157. Design shall be based on the static equivalent of this acceleration as stated in 3.2.5.1.5.1 of the handbook.

3.2.7.1.4.1 **Transport Shock Load Limit.** The 28 volt emergency power system shall not be damaged nor shall subsequent operational performance be degraded as a result of being subjected to the following forces applied statically and independently when properly configured for transit:

a. Horizontal (fore, aft and lateral) 6g .
b. Up 2g
c. Down 4.5g

3.2.7.1.5 **Vibration**

3.2.7.1.5.1 **Transport Vibration.** The 28 volt emergency power system shall be designed to withstand vibration loading as derived in MIL-STD-810E, Figures 514.4-1, 514.4-2 and 514.4-3 based on 50,000 miles total transport distance, and Figure 514.4-15.

3.2.7.1.5.2 **Transit Vibration.** The 28 volt emergency power system shall be designed to withstand shipboard operational vibration per MIL-STD-167, Type I inputs up to 33 Hz.

3.2.7.1.6 **Fungus.** The 28 volt emergency power system shall be designed to resist fungus development and growth, both internally and externally.

3.2.7.1.7 **Humidity.** The 28 volt emergency power system shall be designed to withstand continuous exposure to humidity in the 6% to 95% range (non-condensing).

3.2.7.2 **Operating**

3.2.7.2.1 **Operating Temperature.** The 28 volt emergency power system during discharge shall meet the specified performance requirements when operating in an ambient temperature environment range of -2° C to +60° C. During battery charging, the 28-volt emergency power system shall meet the specified performance requirements when operating in an ambient temperature range of O° C to +45° C.

3.2.7.2.2.1 **Noise and Vibration**

3.2.7.2.2.1 **Vibration, Operation.** Equipment design shall be capable of withstanding Type I, Environmental Vibration specified by MIL-STD-167-1, except that the maximum excitation frequency shall be limited to 50 Hz.

3.2.7.2.2.2 **Noise.** Airborne noise shall not exceed airborne grade C limits in accordance with MIL-STD-740-1. Structure borne vibration shall not exceed Type 3 vibratory RMS acceleration limits in accordance with MIL-STD-740-2.

3.2.7.2.3 **Shock.** All components of the emergency power system which are necessary to produce the output voltage on the 28 VDC bus (i.e., -28 VDC at pin 4 with respect to pin 7 of the mounting tray connector) shall meet performance requirements after being subjected to the following ½ sine wave accelerations:

27 g's for 5 milliseconds athwarth ship (side to side)
14 g's for 3 milliseconds front to
14 g's for 3 milliseconds vertical (top to bottom)

3.2.7.2.4 **Inclination.** The 28 volt emergency power supply shall be capable of operating at any inclination angle up to 60° from its normal operating position.

3.2.7.2.5 **Humidity.** The 28 volt emergency power system shall meet specified performance requirements while exposed to humidity in the 6% to 95% range (non-condensing).

3.2.7.2.6 **Magnetic Field.** The 28-volt emergency power system shall be operational while subjected to a magnetic field of up to 2.5 gauss.

3.2.7.2.7 **Materials, Processes and Parts**

3.2.7.2.7.1 **Threaded Fasteners for Non-Pressure Retaining Parts.** Unless otherwise specified, all non-pressure retaining fasteners shall be corrosion-resistant stainless steel.

3.2.7.2.8 **Electrical Cables, Connectors and Penetrators**

3.2.7.2.8.1 **Cables.** Internal wiring shall be MIL-W-22759 wire. Insulation on all cables shall be non-toxic and non-flammable in oxygen enriched environments. MIL-E-917D provides guidance on material selection. Teflon coated wire or Kaptan polymide film over FEP insulation is preferred.

3.2.7.2.8.2 **Connectors.** Connectors shall be designed so that they may be readily connected or disconnected by the operator without risk of electrical shock. Connector housings shall be suitable to the application environment. Pins and sockets shall be constructed of corrosion resistant material or plated to prevent corrosion and electrical discontinuities.

3.3 **Design and Construction**

3.3.1 **Materials, Processes, and Parts**

3.3.1.1 **Parts Selection.** Parts shall be selected with the following considerations:

a. Parts shall be industrial grade COTS
b. Parts will be identified with complete vendor part numbers (including screening marking if screening is chosen in order to enhance the part reliability)
c. Final parts list will be approved by the procuring activity prior to use

3.3.1.2 **Part De-rating.** For new designs, de-rating of electronic and electromechanical parts shall be in accordance with NAVSEA TE-OOO-AB-GTP-010 or an approved equivalent contractor de-rating requirements procedure. For existing equipment designs it shall be assured that none of the parts are stressed beyond their specified ratings when the equipment is operating in its intended application.

3.3.1.3 **Electrostatic Discharge (ESD).** The contractor shall use ANSIIPC A-610 or equivalent for guidance in the handling and control of hardware containing components susceptible to damaged due to ESD. Warning labels shall be affixed to the protective packaging and to the equipment. Warnings shall be provided in all relevant areas of the system technical manual. Identification markings shall be affixed on all ESD sensitive subassemblies and shall be visible to maintenance personnel prior to maintenance handling of the equipment Enclosures, assemblies and subassemblies containing class 1 or class 2 ESD sensitive components, shall be appropriately marked. Spare parts, modules, printed circuit board subassemblies, and so forth shall be protected from ESD damage.

3.3.1.4 **Parts Availability.** The contractor shall warrant that form, fit, and function equivalents of all components and subassemblies manufactured and supplied by him shall be available to the Procuring Activity for a period of ten (10) years from date of equipment purchase order.

3.3.1.5 **Hazardous Materials.** Materials used in fabrication or required for maintenance shall not adversely effect the health or safety of personnel or introduce atmospheric contaminants that could have deleterious effects on machinery or equipment. Solvents, cleaning agents, oil and materials which could be classified as flammable, or are subject to rapid evaporation or have distinctive odors must be carefully selected. Typical prohibited materials are mercury, asbestos, aerosol spray can products, acetone, methyl ethyl ketone, methyl alcohol, toluene and vinyl chloride. Materials used shall not produce toxic or noxious fumes over the operating temperature range specified or at any temperature below 95° C while non-operating.

3.3.1.6 **Protective Coatings.** The 28 volt emergency power supply shall be finished in accordance with MIL-C-5541, Class 3 as a minimum.

3.3.2 **Electromagnetic Radiation.** The 28 volt emergency power system shall be designed to comply with the electromagnetic radiation parameters specified in MIL-STD-461D, paragraph 5.2, for CE101, CE102, CS101, RE101, RE102, RS101, and RS103. The EMI barrier shall be the Power System housing.

3.3.3 **Nameplate and Product Marking.** Each unit shall be marked in accordance with MIL-STD-130 with the following information:

Manufacturer's Part Number
Manufacturer's Serial Number
Manufacturer's Name, Registered Trademark, or Commercial and Government Entity (CAGE) as listed in Military Handbook H4/H8.

3.3.4 **Workmanship.** Soldering and workmanship standards shall conform to IPC-A61 0 Class 2.

3.3.5 **Interchangeability.** Parts, components, or equipment considered as interchangeable shall comply with requirement 7 of MIL-STD-454.

3.3.6 **Safety.** Safety precautions shall be taken in equipment design per MIL-STD-454, Requirement 1. High power areas shall be covered and marked and grounding precautions taken in accordance with Requirement 1, Section 5. Mechanical hazards shall be prevented per Requirement 1, Section 8. Hazardous materials requirements of paragraph 3.3.1.5 shall be adhered to.

3.3.6.1 If the battery chemistry selected is Lithium, safety testing shall be performed in accordance with NAVSEA 9310.

3.3.7 **Human Performance/Human Engineering.** The equipment shall be designed for ease of operation of the man-machine interface for all equipment functions. The equipment shall exhibit a modular design architecture which provides for replacement of assemblies. The design criteria of MIL-STD-1472 shall be used as guidance for all man-machine interfaces. Items requiring man-handling shall be labeled in accordance with paragraph 5.9.11.3.9 therein, based on a five foot lifting height.

3.4 **Documentation.** Documentation shall be provided as specified in the purchase order, to include as a minimum, electrical/mechanical drawings, schematics and block diagrams.

3.5 **Logistics.** The vendor shall warrant that a continued source of supply of additional items be available to the procuring activity. Warrant shall include availability of parts, components and services, which shall be required to ensure continued use of items purchased.

3.6 **Qualification.** Qualification, as used herein, refers to the verification or validation of the item's conformance to the requirements specified herein. Qualification METHODS used to assure that specified requirements have been satisfied may include ANALYSIS, SIMULATION, DEMONSTRATION, INSPECTION, TEST; or a combination of these.

Where applicable, qualification by SIMILARITY to previously qualified similar items shall be emphasized.

3.6.1 **Certificate of Compliance.** The certificate of compliance submitted to the procuring activity shall state the vendor's product meets all requirements specified herein.

3.7 **Quality Conformance.** A certificate of conformance to the inspection criteria of paragraph 4.0 herein shall be provided with each item delivered to this drawing. The certificate shall indicate by serial number(s) each specific item to which the certificate of conformance applies.

3.8 **Notification of Change.** The vendor shall notify the procuring activity, in writing, of any change to the items, which may affect attributes of qualification or quality conformance referred to in paragraph 4.0.

3.9 **Verification and Review.** The procuring activity reserves the right to review the vendor's facility and audit date/documentation supporting the qualification and quality conformance certification referred to in paragraph 4.0.

4.9 **QUALITY ASSURANCE PROVISIONS**

4.1 **General**

4.1.1 **Responsibility for Inspection.** The vendor is responsible for controlling the quality of his product and for performing all necessary inspection and tests to ensure that items delivered to the procuring activity meet the requirements of this drawing. The procuring activity reserves the right to re-inspect or retest items to determine their acceptability.

4.1.2 **Inspection System.** The vendor shall provide a quality inspection system conforming to the requirements of MIL-I-45208 or equivalent. Inspection and test equipment must be calibrated in accordance with MIL-STD-45662. All calibration standards must be traceable to the National Institute of Standards and Technology (NIST).

4.1.3 **Qualification Provisions.** The vendor shall provide a certificate of compliance in accordance with paragraph 3.6.1 together with supporting data, which verifies that the specified requirements are complied with. The vendor shall provide a summary (tabular form), which correlates each drawing requirement to a qualification method, and reference the supporting data item provided to verify compliance.

4.2 **Quality Conformance Inspection.** Quality conformance inspection shall be performed in accordance with the vendor's documented acceptance test procedures, which shall be submitted to the procuring activity for review and approval as specified in the purchase order.

4.2.1 **Reliability.** The reliability tests specified in paragraph 3.2.5.2 herein shall be performed prior to or as part of the quality conformance inspections.

4.2.2 [SOC] **Certificate of Conformance.** The vendor shall provide a certificate of conformance In accordance with paragraph 3.7 herein.

4.2.3 [SOC] **As Built Verification.** This assembly will be audited by Quality Assurance to verify it meets all drawing requirements.

4.2.4 [SOC] **In-Kind Replacement.** Replacement of components within this assembly shall be In-Kind Replacement of parts which meet Form, Fit and Function.

5.0 **PREPARATION FOR DELIVERY**

5.1 **Packaging and Packing Requirements.** All items shall be packed and packaged, using good commercial practices, to ensure parts will arrive at destination without damage.

5.0 **Data Requirements.** Certificates of conformance required by 3.7 herein shall accompany each item delivered to the procuring activity.

6.0 **NOTES**

6.1 Identification of the approved source(s) of supply herein is not to be construed as a guarantee of present or continued availability as a source of supply for the item described in the drawing.

6.2 **Suggested Source(s) of Supply**

Note - Control numbers shall be the drawing number followed by a dash; example: 1234567-1

Note - Use the Vendor Tracking System (VTS) where vendor still needs to specify his new part number. If the vendor has already specified his part number, this should be included at this time.

TABLE I

PROCURING ACTIVITY PART NUMBER	VENDOR CAGE CODE	VENDOR PART NUMBER	DESCRIPTION
5793519-2			28 Volt Emergency Power Supply Modification Drawing, 28 Volt Emergency Power Supply Mounting Tray
5793519-3			

VENDOR CAGE NUMBER	VENDOR NAME AND ADDRESS

6.3 **Spare Modules.** The modules, parts, and assembles listed in Table 1 are part of the 28 volt Emergency Power System and may be procured as spare items. Quality conformance inspection of the spare modules shall be in accordance with paragraph 4.2 herein. The vendor shall provide a certificate of conformance in accordance with paragraph 3.7 for each spare module delivered to the procuring activity.

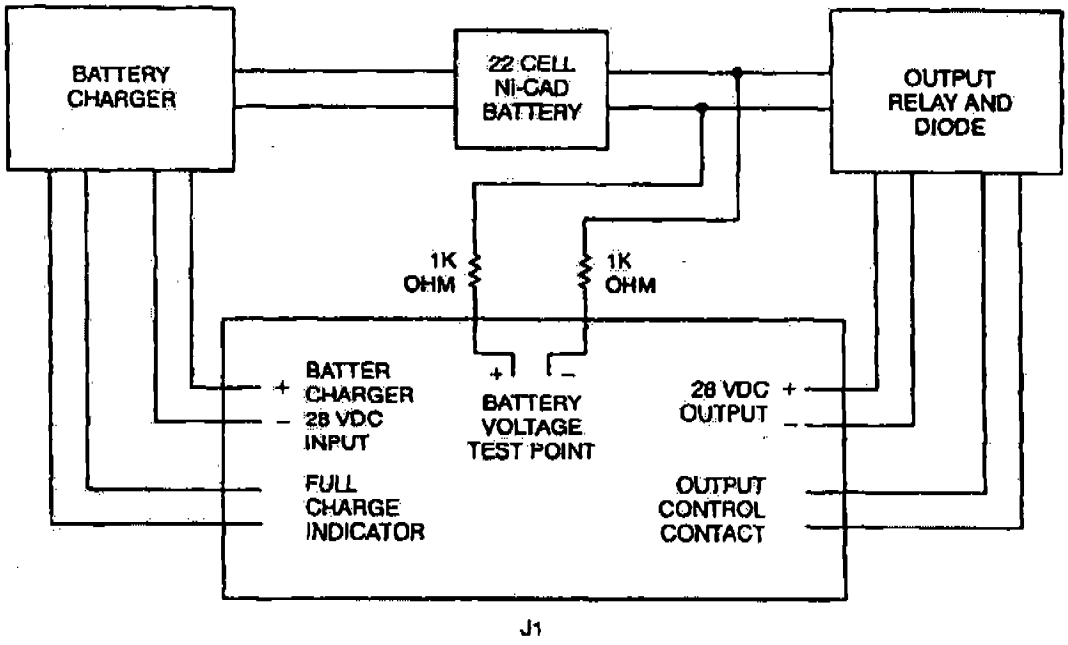
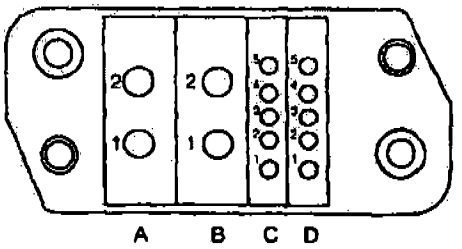


Figure 1.

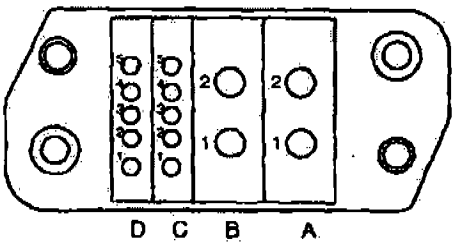
28-Volt Emergency Power System Block Diagram

MALE PLUG
FRONT VIEW
PART NUMBER LPH6/2RM3/2MMST/TG



THIS CONNECTOR IS ON THE EMERGENCY POWER SUPPLY MOUNTING TRAY

P1



THIS CONNECTOR IS ON THE EMERGENCY POWER SUPPLY

J1

FEMALE RECEPTACLE
FRONT VIEW

PART NUMBER LEH6/2RF3/2UF5/TAH

CONNECTOR PIN OUT

PIN D1	OUTPUT ON CONTROL (–) #1
PIN D2	OUTPUT ON CONTROL (+) #1
PIN D3	FULL CHARGE INDICATOR (–)
PIN D4	BATTERY CHARGER INPUT (–)
PIN D5	BATTERY CHARGER INPUT (+)
PIN C1	OUTPUT ON CONTROL (–) #2
PIN C2	OUTPUT ON CONTROL (+) #2
PIN C3	FULL CHARGE INDICATOR (+)
PIN C4	BATTERY VOLTAGE SAMPLE (–)
PIN C5	BATTERY VOLTAGE SAMPLE (+)
PIN B1	EMERGENCY POWER OUTPUT (–) #1
PIN B2	EMERGENCY POWER OUTPUT (+) #1
PIN A1	EMERGENCY POWER OUTPUT (–) #2
PIN A2	EMERGENCY POWER OUTPUT (+) #2

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Figure 2. 28 Volt Emergency Power System Connector Part Numbers and Pin Designations

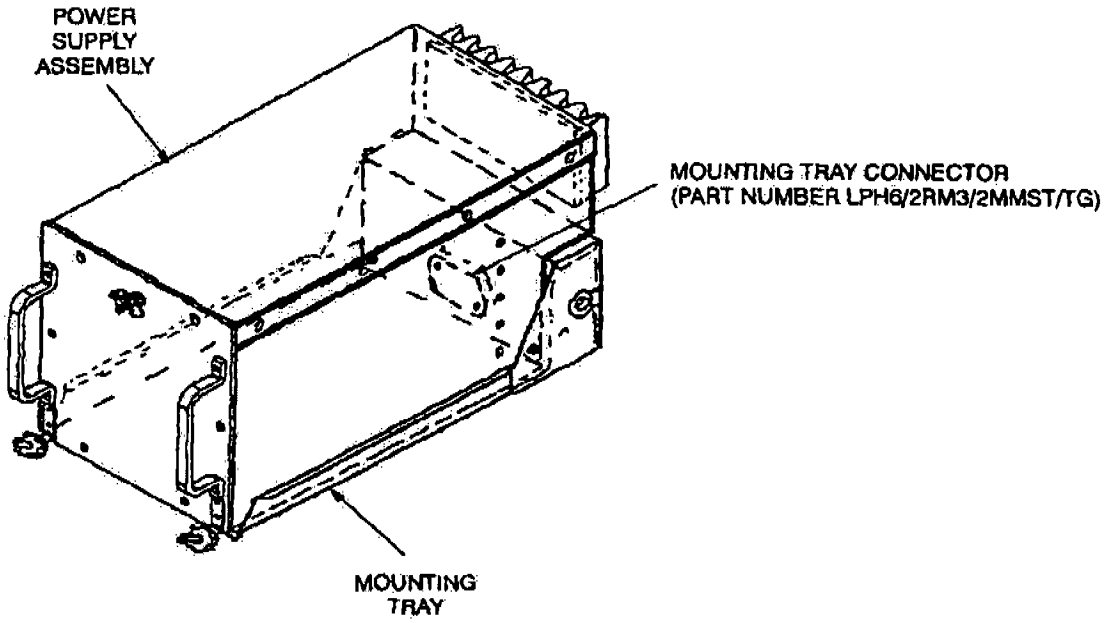


Figure 3. 28-Volt Emergency Power System
(Power Supply Assembly Mounted In Tray)

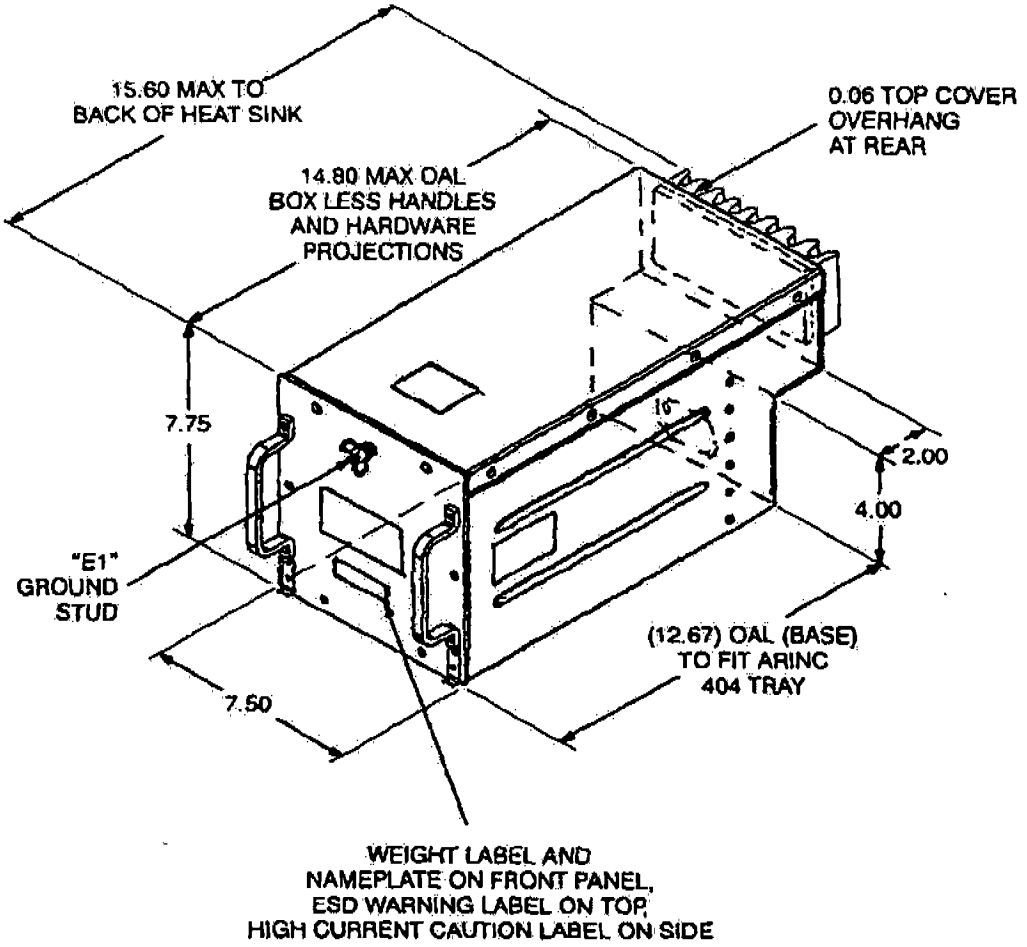
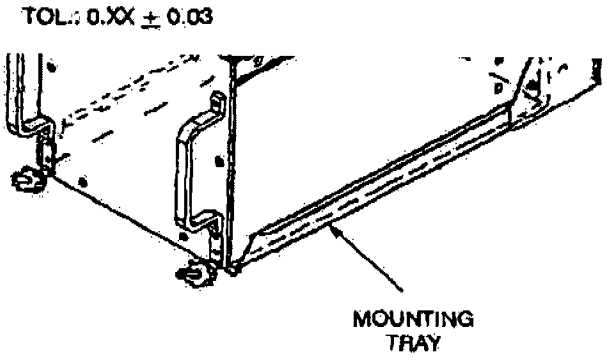


Figure 4.
Emergency
Power Supply



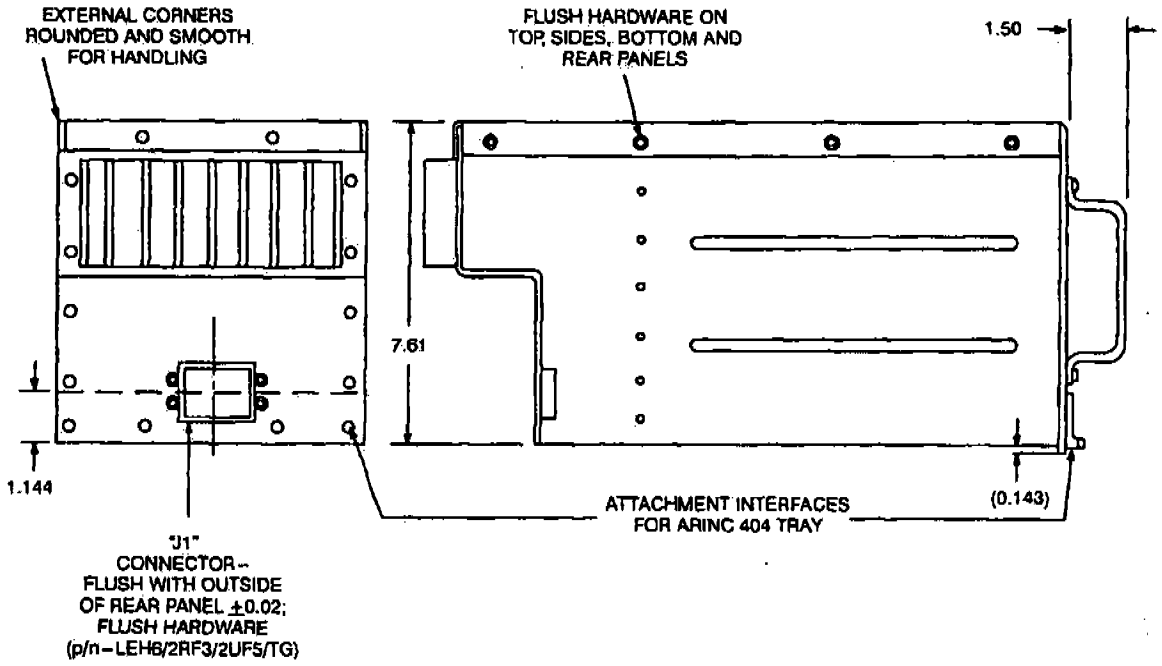


Figure 5. Emergency Power Supply